

## CLAIMS

### WHAT IS CLAIMED IS:

1. A method of communicating data, the method comprising the steps of:  
transmitting a plurality of electromagnetic pulses, wherein a time period between  
N pulses is variable;  
receiving the plurality of pulses;  
5 determining the time period between each pulse; and  
assigning a data value to N pulses based on the time period between N pulses.
2. The method of claim 1, wherein the time period between each pulse can range  
from about 50 pico-seconds to about 10 nano-seconds.
3. The method of claim 1, wherein N pulses can range from 1 pulse to 10 pulses.
- 10 4. The method of claim 1, wherein the assigned data value is a group of bits selected  
from a group consisting of: a 4-bit group, a 6-bit group, a 8-bit group, a 16-bit group, a  
32-bit group, a 64-bit group and a 128-bit group.
5. The method of claim 1, wherein the electromagnetic pulse is selected from a  
group consisting of: ultra-wideband pulses and impulse radio pulses.
- 15 6. The method of claim 1, wherein the time period between each pulse is determined  
by a dispersion characteristic of a transmission media.
7. The method of claim 6, wherein the transmission media is selected from a group  
consisting of: air, an optical fiber ribbon, a fiber optic cable, a single mode fiber optic

cable, a multi mode fiber optic cable, a twisted pair wire, an unshielded twisted pair wire, a plenum wire, a PVC wire, a coaxial cable, and an electrically conductive material.

8. The method of claim 1, wherein a minimum pulse transmission rate is determined by the steps of:

5 obtaining a power spectral density of the transmitted pulses;

increasing the pulse transmission rate until the power spectral density attains a predetermined level.

9. The method of claim 8, wherein the predetermined level of the power spectral density can range between about -40dBm to about -150dBm.

10. The method of claim 1, wherein the plurality of electromagnetic pulses transmit data selected from a group consisting of: telephony data, high-speed data, video data, television data, Internet communication data and audio data.

11. The method of claim 1, wherein the data is communicated through a wire network that is selected from a group consisting of: a power line, an optical network, a cable television network, a community antenna television network, a community access television network, a hybrid fiber coax system network, a public switched telephone network, a wide area network, a local area network, a metropolitan area network, a TCP/IP network, a dial-up network, a switched network, a dedicated network, a nonswitched network, a public network and a private network.

12. The method of claim 11, wherein the data is communicated substantially simultaneously with a wire network communication signal.

13. The method of claim 1, wherein the step of transmitting a plurality of electromagnetic pulses includes varying the time period between N pulses and varying a pulse amplitude of N pulses.

14. A method of communicating data, the method comprising the steps of:  
means for transmitting a plurality of electromagnetic pulses, wherein a time period between N pulses is variable;  
means for receiving the plurality of pulses;  
means for determining the time period between each pulse; and  
means for assigning a data value to N pulses based on the time period between N pulses.

15. A computer program product for directing a general purpose digital computer to perform a desired function comprising:

a set of computer readable instructions to transmit a plurality of electromagnetic pulses, wherein a time period between each pulse is variable;

a set of computer readable instructions to receive the plurality of pulses;

a set of computer readable instructions to determine the time period between each pulse; and

a set of computer readable instructions to assign a data value to N pulses based on the time period between each pulse.

16. The computer program product of claim 15, wherein the time period between each pulse can range from about 50 pico-seconds to about 10 nano-seconds.

17. The computer program product of claim 15, wherein N pulses can range from 1 pulse to 10 pulses.

18. The computer program product of claim 15, wherein the assigned data value is a group of bits selected from a group consisting of: a 4-bit group, a 6-bit group, a 8-bit group, a 16-bit group, a 32-bit group, a 64-bit group and a 128-bit group.

19. The computer program product of claim 15, wherein the electromagnetic pulse is selected from a group consisting of: ultra-wideband pulses and impulse radio pulses.

20. The computer program product of claim 15, wherein the time period between each pulse is determined by a dispersion characteristic of a transmission media.

21. The computer program product of claim 15, wherein the transmission media is selected from a group consisting of: air, an optical fiber ribbon, a fiber optic cable, a single mode fiber optic cable, a multi mode fiber optic cable, a twisted pair wire, an unshielded twisted pair wire, a plenum wire, a PVC wire, a coaxial cable, and an electrically conductive material.

22. The computer program product of claim 15, wherein a minimum pulse transmission rate is determined by the steps of:

obtaining a power spectral density of the transmitted pulses;

increasing the pulse transmission rate until the power spectral density attains a predetermined level.